

Amendments to claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1.(Currently amended) A variable optical attenuator comprising:

- an input fiber for receiving an input optical signal to be attenuated;
- an output fiber for outputting said attenuated optical signal;
- an optical path disposed between said input fiber and said output fiber,
through which said optical signal passes;
- at least one pixelated phase changing element, disposed in said the
optical path between said input fiber and said output fiber such that part of said optical
signal passes through at least one pixel of said at least one pixelated element; and
- a drive source applied to said at least one pixel, operative to change the
phase of that part of said optical signallight passing through said at least one pixel.at
least part of said at least one element;
- ~~wherein the operation of said phase changing element is effected by rotation of~~
~~an optical axis of said element.~~

2. (Cancelled)

3.(Original) A variable optical attenuator according to claim 1, and wherein said at least one phase changing element is at least one liquid crystal element.

4. (Original) A variable optical attenuator according to claim 2, and wherein said at least one phase changing element is at least one liquid crystal element.

5.(Original) A variable optical attenuator according to claim 3, and wherein said at least one liquid crystal element comprises a serial pair of parallel aligned liquid

13. (Currently amended) A variable optical attenuator according to claim 91, and wherein said at least one pixel is an array of a number of strip pixels running across the element, said array dividing said element into approximately equal pixelated and non-pixelated areas.

14. (Original) A variable optical attenuator according to claim 1, and wherein said input fiber and said output fiber are disposed such that light passes by transmission between them.

15. (Original) A variable optical attenuator according to claim 1, and also comprising a reflecting surface, and wherein said input fiber and said output fiber are disposed such that light passes by reflection between them.

16. (Original) A variable optical attenuator according to claim 15, and wherein said reflecting surface is formed on the rear side of said phase changing element.

17. (Currently amended) A variable optical attenuator according to claim 91, and wherein said at least one pixel is formed by means of at least one pixelated electrode located essentially over the area of said at least one pixel.

18. (Currently amended) A variable optical attenuator according to claim 91, and wherein said at least one pixel is formed by means of at least one electrode located remotely from the area of said at least one pixel.

19. (Original) A variable optical attenuator according to claim 3, and wherein said at least one liquid crystal element comprises a serial pair of parallel aligned liquid crystals with a half wave plate disposed between them, such that said attenuator is insensitive to the direction of polarization of said optical signal.

20. (Original) A variable optical attenuator according to claim 19, and wherein said half

wave plate is operative as a substrate for one of said liquid crystal elements.

21.(Original) A variable optical attenuator according to claim 19, and wherein said half wave plate is operative as an alignment layer for one of said liquid crystal elements.

22.(Original) A variable optical attenuator according to claim 3, and wherein said at least one liquid crystal element comprises a liquid crystal with a quarter wave plate disposed in proximity to said liquid crystal, and also comprising a reflecting surface, and wherein said input fiber and said output fiber are disposed such that light passes by reflection between them.

23.(Original) A variable optical attenuator according to claim 22, and wherein said reflecting surface is formed on the rear side of said quarter wave plate.

24.(Original) A variable optical attenuator according to claim 22, and wherein said quarter wave plate is operative as a substrate for said liquid crystal element.

25.(Original) A variable optical attenuator according to claim 22, and wherein said quarter wave plate is operative as an alignment layer for said liquid crystal element.

26.(Currently amended) An optical device comprising:

an input fiber;

an output fiber;

an optical path disposed between said input fiber and said output fiber;

and

at least one pixelated phase changing element disposed in said optical path; and

a drive source applied to at least one pixel of said at least one pixelated element, operative to change the phase of part of the cross section of light passing from said input fiber to said output fiber, wherein said device is operative as a mode-

converter.

27-38. (Cancelled)

39.(Currently amended) An integrated ~~phase changing element for use in a variable~~ optical attenuator, comprising:

an optical fiber for inputting and outputting an optical signal;

a pixelated phase changing element, disposed at an end of said fiber, such that part of said input optical signal passes through at least one pixel of said pixelated element;

a substrate reflecting light transmitted through said pixelated phase changing element back to said optical fiber;

at least one detector element, disposed such that it detects said reflected light not propagated back down said fiber; and

drive circuitry for controlling the phase change introduced in the passage of said part of said input optical signal light through said at least one of the pixels of said pixelated phase changing element.

40. (Currently amended) A multi-channel variable optical attenuator comprising:

a plurality of input fibers for receiving a plurality of input optical signals to be attenuated;

a plurality of output fibers for outputting said plurality of optical signals after being attenuated, individual ones of said output fibers being aligned generally opposite individual ones of said input fibers;

optical paths disposed between individual ones of said input fibers and said output fibers, through which said plurality of optical signals pass;

at least one pixelated phase changing element, disposed in at least one of the optical paths between said at least one of said input fibers and one of said output fibers, such that part of said optical signal in said at least one optical path passes through at least one pixel of said at least one pixelated element; and

a drive source applied to said at least one pixel of said at least one

pixelated element, operative to change the phase of that part of said optical signal light passing through ~~at least part of said at least one element~~ said at least one pixel ~~wherein the operation of said phase changing element is effected by rotation of an optical axis of said element.~~

41-43 (Cancelled)

44.(New) A variable optical attenuator according to claim 1, wherein said change of phase is effected by rotation of an optical axis of said at least one pixel of said phase changing element.

45.(New) A multi-channel variable optical attenuator according to claim 40, wherein said change of phase is effected by rotation of an optical axis of said at least one pixel of said element.

46.(New) A multi-channel variable optical attenuator according to claim 40, wherein said at least one phase changing element is at least one liquid crystal element.